

**Assessment of thrombin generation using thromboelastometry in cirrhotic patients with hepatocellular carcinoma undergoing liver transplantation**

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**Abstract**

Due to the mixed etiology of liver disease, cirrhotic patients with hepatocellular carcinoma may have either a pro-thrombotic or a bleeding tendency. Haemostatic assessment and blood management represent key issues during liver transplantation (LT) having a significant impact on survival and postoperative outcome. Our aim was to assess haemostatic profile in liver transplant recipients with hepatocellular carcinoma (HCC) and to evaluate its impact on perioperative anaesthetic management. We prospectively included 122 patients that underwent liver transplantation between January and December 2013. Exclusion criteria were incomplete data recall, preoperative anticoagulation treatment, acute liver failure and emergency re-transplantation. Coagulation was assessed using standard coagulation tests and rotational thromboelastometry (ROTEM®) assay performed preoperative and 15 minutes after reperfusion of the liver. We recorded intraoperative blood loss, transfusion requirements, Post Anaesthesia Care Unit length of stay and incidence of postoperative renal, pulmonary, thrombotic and hemorrhagic complications. After we applied the exclusion criteria, 80 patients were included in the final analysis: 24 patients in the HCC group and 56 in the non-HCC group. Patients with HCC had increased preoperative thrombin generation demonstrated by a shorter clot formation time (142 vs. 381 sec,  $p=0.01$ , 95% CI [41.9, 292.4] ) and a shorter time to maximum velocity of clot formation (153 vs. 209,  $p=0.027$ , 95% CI [6.59, 105.3] ). Intraoperative findings showed no differences in blood loss between the two groups, but lower fresh frozen plasma requirements (11.5 vs. 16.6 units,  $p=0.031$ ) was observed in the HCC group. Intraoperative ROTEM® variables were similar in both groups measured after reperfusion of the graft. No statistically significant differences in postoperative outcome were observed between groups. In conclusion, patients in HCC group have increased preoperative thrombin generation as demonstrated by ROTEM derived parameters. During major abdominal surgery, like LT, and increased blood loss thrombin generation is similar in patients with and without HCC, demonstrating that haemostatic reserve is limited in HCC group.

**Key words:** liver transplantation, thromboelastometry, thrombin generation potential, hepatocellular carcinoma

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